

José Nicolás Orce's CV
Fundamental Nuclear Physics & Applications

Mintirho ya Vulavula

Address: Department of Physics & Astronomy, University of the Western Cape, P/B X17 Bellville 7535, South Africa

Managing People & Resources: GAMKA Business Plan, MANDELAb Project

Emails: jnorce@uwc.ac.za nico.orce@cern.ch

Secured Funding: R55 Millions

Website: <https://nuclear.uwc.ac.za>

Conference Chair: Tastes of Nuclear Physics (10 Cont Years)

YouTube: Nico Orce's Physics Channel (+35k Views)

Spokesperson of Experiments @ CERN, TRIUMF, iThemba LABS, SALT

GitHub: [UWCNuclear](#) (Big Data 4 Nuclear Physics)

Graduated Students: 20 (16 Black South Africans)

Advanced Lectures & Research Projects: MANuS/MatSci

h-index / 10-index: 21 / 47 (Google Scholar)

NRF Rating: C1 (2011-16), B2 (International Recognition, 2017-22)

Lecturer: Broad Spectrum of Physics Subjects

Keynote/Invited Talks: 20+ (CERN, INPC, Gordon Conference,...)

Active Referee in 10 Peer-Reviewed Journals

Editorial Board Member: Atomic & Nuclear Data Tables

Peer-Reviewed Publications: 140+

Interdisciplinary Research: Physics, Astronomy, Maths & Biology

Ongoing International Collaborations: UK, Switzerland, USA, Spain, France, China, Canada, India, Italy, Australia, Germany

Nomination (2021) for the Margarita Salas Award aimed to recognize international impact, contributing to social progress in exemplary and extraordinary way

"Grow up to be yet braver than we!" Spartan chorus

EDUCATION / CAREER

- [Full Professor in Physics](#) (2017-22) University of the Western Cape (Cape Town, South Africa)
- [Honorary Visiting Professor](#) (2018-23) University of York (York, UK)
- [Associate Professor in Physics](#) (2013-16) University of the Western Cape (Cape Town, South Africa)
- [Lecturer in Physics](#) (2011-12) University of the Western (Cape Town, South Africa)
- [Postdoctoral Research Fellow @ TRIUMF](#) (2008 - 2010)
Canadian National Facility for Nuclear and Particle Physics (Vancouver, Canada)
- [Assistant Professor](#) (2007) Eastern Kentucky University, Richmond (Kentucky, USA)
- [Research Associate](#) (2006 - 07) University of Kentucky, Lexington (Kentucky, USA)
- [Postdoctoral Scholar](#) (2003-06) University of Kentucky, Lexington (Kentucky, USA)
- [Ph.D. in Experimental Nuclear Physics](#) (2000-03) "Multi-quasiparticles and shape-driving effects in ^{128}Xe , ^{127}I and ^{125}Sb ", University of Brighton. Supervisor Prof A M Bruce (Brighton, East Sussex, UK). Data from Experiments @ ANU
- [Electronics Engineering](#) (1999) Electromagnetic Pulse (EMP), Nuclear Origin and Effects in Electronic Devices (Shielding Theory), Universidad de Granada (Granada, Spain)
- [Licenciatura \(5 Years Degree\) in Fundamental Physics](#) (1993 -1999) University of Granada (Granada, Spain)

TALKS & SEMINARS (Last 5 Years)

- [Universality of Abundances in R-Process Nucleosynthesis](#). Invited Speaker (IS) @ International Conference on Shapes & Symmetry in Nuclei (SSNET). Paris, France (2022)
- [Elemental Patterns](#). Keynote Speaker (KS) @ SciFest Africa (2021)
- [Enhanced Symmetry Energy behind the Universality of Heavy-Element Abundances](#). IS @ ISOLDE Workshop (2021)
- [Mini-School on Mathematical Modelling of Covid-19](#). Main Organizer and Speaker @ NITheCS (2021)
- [How Atomic Nuclei Polarize](#). KS @ International Conference on Recent Issues in Nuclear & Particle Physics (RINP2), Visva-Bharati University, Santiniketan, India (2019)
- [How do we Infer Shell Effects @ High-Excitation Energies?](#) IS @ International Conference on Nuclear Structure & Dynamics (NSD), Venice, Italy (2019)
- [Coulomb-Excitation Studies @ iThemba LABS](#), IS @ ANSTT2 Workshop, iThemba LABS (2019)
- [Nuclear Polarizability Effects in Coulomb-Excitation Studies of Light and Medium-Mass Nuclei](#). IS @ 3rd GOSIA Workshop, Heavy Ion Laboratory, University of Warsaw, Warsaw, Poland (2018)
- [Review of SA Physics at ISOLDE from UWC's Perspective](#). IS @ SA-CERN 10-Year Celebration (2018)
- [Nuclear Polarizability Effects @ Low Excitation Energies](#). Speaker @ 6th International Conference on Collective Motion in Nuclei under Extreme Conditions (COMEX6), Cape Town (2018)
- [Breaking Heavens Code: How Were/Are the Elements Made?](#) IS @ XIII (2018) and Xth (2020) Tastes of Nuclear Physics.
- [When Atomic Nuclei Polarize](#). IS @ Isospin, SStructure, Reactions and energy Of Symmetry (ISTROS), Slovakia (2017).
- [Colloquia, Webinars & Lectures given @](#) Panjab University (India), iThemba LABS, UCT, NMU, NITheCS (SA), IFIC (Spain), TRIUMF (Canada), Cambridge (UK), CERN (Switzerland), University of York (UK), University of Notre Dame (USA)

Nuclear Physics Experiments carried out in the last years (Spokesperson):

- [First Coulomb-excitation Experiments running @ iThemba LABS](#) using particle-gamma coincidence technique (2015-16)
- [Leading experiments running @ HIE-ISOLDE](#) CERN, July 2017 [Ubuntu Experiment @ CERN](#)
- [Leading experiments @ TRIUMF](#) (Vancouver Canada, July 2018)
- [First Coulomb-excitation of \$^{12}\text{C}\$ using high-intense beams @ Maier-Leibniz-Laboratory](#) (Munich, May 2018)
- [First pre-GAMKA Experiment @ iThemba LABS using the Soccerball Frame](#) (October 2019)
- [Development of New Exotic Beams using the MIVOC method @ iThemba LABS](#) (PI, $^{60-62}\text{Ni}$ beams delivered in 2019)
- [Development of the Modern African Nuclear DEtector LABORatory @ UWC/UZ](#) (PI, Commissioned in March 2022)
- [Current Nuclear Physics Proposals \(Spokesperson\) @ IDS \(CERN\), TIGRESS \(TRIUMF\), GAMKA \(iThemba LABS\)](#)
- [Other Nuclear Physics Experiments & Astronomy observations carried out previously @:](#) The Australian National University (ANU), GANIL, Yale University, University of Notre Dame, University of Cologne, Duke University, University of Kentucky, Universität Stuttgart, TRIUMF, Argonne National Laboratory, University of Washington, iThemba LABS, HIE-ISOLDE/CERN and SALT (High-Resolution Spectroscopy of Metal-Poor Stars)
- [Referee](#) of Physical Review C (American Physical Society), Journal of Physics G (Institute of Physics), European Journal of Physics A, EPJ Web of Conferences (Springer), Physics Letters B, Vacuum, Nuclear Instrumentation and Methods A & Applied Mathematical Modelling (Elsevier), Canadian Journal of Physics, SAIP (South African Institute of Physics)
- [Member of the Research Science Faculty Committee @ UWC](#) (2012-22)
- [Member of the Program Advisory Committee \(PAC\) @ iThemba LABS](#) (2016-17)
- [Chair of Physics Users & Member of Director's Council @ iThemba LABS](#) (2016-17)
- [Synergy with SKA. Mini-Workshop on Gravitational Waves, Radio Astronomy & Nuclear Physics @ UWC](#) (2018)

PI RESEARCH GRANTS (Total -R55M = €3.2M)

- [Spokesperson and Grant Holder for GAMKA: NRF Strategic Research Equipment](#) (R35M, Leading institution: UWC) Single largest grant given by the NRF in a competitive call. Develop Science Case + Business Plan, NRF Panel Defense, Manage Finances, Design+Manufacturing of the [Dandelion Frame](#) hosting the GAMKA array. Commissioned in May 2021
- [UWC's GAMKA Related Research](#) (R250k/year), [Prestige Postdoc](#) (R500k) and [Startup Funds](#) (250k)
- [NRF Program for Competitive Rated Researchers](#) (R800k)
- [NRF/DST Conference Funds: IX Tastes of Nuclear Physics. International Conference @ UZ](#) (R800k)
- [NRF Travel + KIC Funds: TRIUMF experiment + International Visitors](#) (R120k)
- [Global Challenge Research Funds/ Science & Technology Facilities Council in the UK](#) (MANDELAb Phase 1, [R2M](#) / Phase 2 [R10M](#) / Phase 3, [R4M](#)). MANDELAb @ [UWC/UZ](#) Equipped with the Fastest Digital Systems, Permitting cutting-Edge Investigations of Ancillary Detectors to be Coupled with GAMKA and Cancer Imaging, and Securing state-of-the-art Training for the New Generation of Students & Researchers in South Africa
- [Physics World: MANDELAb Nuclear-Physics Laboratories Open in South Africa](#)
- [SA-CERN Collaboration: Trips to CERN, Visitors, Equipment](#) (R300k)
- [Sponsors: XIA Digital Electronics \(USA\), MICRON Semiconductors \(UK\), Bio-Teknik](#) (R250k)
- [NITheCS Project. Big Data Science applied to Nuclear Physics](#) (R500k)

SELECTED PUBLICATIONS (Last 5 Years) Visit [ResearchGate](#) or [Google Scholar Citations](#) for a Detailed List

- JE Amaro & JN Orce, [Monte Carlo Simulation of COVID-19 using Planck's Probability Distribution](#), Biosystems **218** (2022). Elsevier Public Health Emergency Collection. IF: 1.973
- JN Orce, [Competition between \(y,p\) and \(y,n\) Photo-Disintegration Yields](#), At. Nuclear Data Tables **146** (2022). IF: 2.6
- JN Orce *et al.*, [Reorientation-Effect Measurement in \$^{36}\text{Ar}\$](#) , Letter in Physical Review C **104** (2021). IF: 3.09
- JN Orce & SS Ntshangase, [Young African Universities Take the Lead](#), Nature Physics **17** (2021). IF: 20.03
- JE Amaro, J Dudouet & JN Orce, [Global Analysis of the COVID-19 using Simple Epidemiological Models](#), Applied Mathematical Modelling **90** (2021). Elsevier Public Health Emergency Collection. IF: 5.129
- JN Orce, [Polarizability Effects in Atomic Nuclei](#), Int J Modern Physics E Vol. **29**, No. **03** (2020). Top 2020 Most Read Articles and Selected as Long-Standing Value for the Last 30 Years
- C Ngwetsheni & JN Orce, [Influence of Shell Effects @ High-Excitation Energies](#), Physics Letters B **792** (2019). IF: 4.771
- K Kapoor, JN Orce *et al.*, [Modern African Nuclear DEtector LABORatory](#), Hyperfine Interactions **240** (2019). IF: 1.128
- PE Garrett *et al.*, [Multiple Shape Coexistence in \$^{110,112}\text{Cd}\$](#) , Physical Review Letters **123** (2019). IF: 9.161
- K Raju, JN Orce *et al.*, [Reorientation-effect measurement of the first \$2^+\$ state in \$^{12}\text{C}\$](#) , Phys Letters B **777** (2018). IF: 4.771
- SA Gillespie *et al.*, [Coulomb excitation of \$^{80,82}\text{Kr}\$ and change in structure @ \$N=Z=40\$](#) , Physical Review C **104** (2021). IF: 3.09
- J. N. Orce *et al.*, [Enhanced symmetry energy may bear universality of r-process abundances](#), Under Review (2022)
- Other Publications by my Students. P. Butler, L.P. Gaffney,...., K. Abrahams *et al.*, [The Observation of Vibrating Pear-Shapes in Radon Nuclei](#), Nature Communications **10** (2019). IF: 14.92. P. Butler *et al.*, [Evolution of Octupole Deformation Evolution of Octupole Deformation in Radium Nuclei](#), Physical Review Letters **124** (2020). IF: 9.161

STUDENT SUPERVISION (Generally Main Supervisor from Projects Approved by International Committees)

- **Graduated Students/Postdocs:** [Dinoko \(PhD 2013\)](#), [Khumalo \(MSc 2014\)](#), [Erasmus \(MSc 2014\)](#), [Mehl \(MSc 2015\)](#), [Singh \(MSc 2016\)](#), [Raju \(PDF 2016\)](#), [Mokgolobotho \(MSc 2017\)](#), [Sowazi \(MSc 2018\)](#), [Nogwanya \(MSc 2018\)](#), [Masango \(MSc 2019\)](#), [Ngwetsheni \(MSc 2019\)](#), [Akakpo \(MSc 2019\)](#), [Kheswa \(PhD 2019\)](#), [Martin Montes \(MSc 2019\)](#), [Mavela \(MSc 2019\)](#), [Davis \(MSc 2019\)](#), [O'Neill \(PDF 2018\)](#), [Kapoor \(PDF 2019\)](#), [Abrahams \(PhD 2021\)](#), [Wakudyanyaye \(MSc 2021\)](#), [Bucher \(PDF 2021\)](#)
- **Current Students/Postdocs:** [Ngwetsheni \(PhD\)](#), [Mehl \(PhD\)](#), [Akakpo \(PhD\)](#), [Motimele \(PhD\)](#), [Wakudyanyaye \(PhD\)](#), [Mthembu \(PhD\)](#), [Radebe \(MSc\)](#), [Zulu \(MSc\)](#), [Lesch \(MSc\)](#), [Madonsela \(MSc\)](#), [Jafta \(MSc\)](#), [Bernier \(PDF\)](#), [Abrahams \(PDF\)](#)
- **Alumni:** [Mokholobotho \(Data Engineer\)](#), [Kapoor \(PDF Canada\)](#), [Mavela \(High-School\)](#), [Sowazi \(CEO @ CENHUBSP\)](#), [Raju \(PDF Japan & China\)](#), [Khumalo \(NNR\)](#), [Dinoko \(NMISA\)](#), [Erasmus \(Software Engineer\)](#), [Davis \(NRG, Netherlands\)](#), [Masango \(NECSA\)](#), [Kheswa \(MRD iThemba LABS\)](#), [Bucher \(Lecturer CPUT\)](#), [O'Neill \(Researcher U Bergen\)](#)
- **Postgraduate Examiner:** 10+ MSc and PhD Theses
- **Student Exchange Programs @** University of York, TRIUMF, CERN, Imperial College London, University of Kentucky
- **Presentations given by my Students/Postdocs:** [Khumalo \(SAIP Winner\)](#), [Masango \(CERN, CAGRA Japan, Tastes, SAIP\)](#), [Abrahams \(ISOLDE, SAIP, ANSTT2, Tastes Winner\)](#), [Ngwetsheni \(SAIP Winner, ANSTT2, Tastes Winner, RINP2, India, Hyperfine Interactions\)](#), [Kapoor \(Hyperfine Interactions, India, Tastes\)](#), [Lomborg \(Brazil, Tastes, ANSTT2\)](#), [Mokgolobotho \(SAIP, Tastes, 4th SA-JINR\)](#), [Mehl \(Nuclear Structure 2016 USA, 4th SA-JINR Winner\)](#), [Bernier \(Tastes, TRIUMF\)](#), [Raju \(4th SA-JINR, Dubna, DAE-BRNS, India, SAIP\)](#), [Akakpo](#), [Mavela and Lesch \(Tastes, SAIP\)](#), [Mthembu \(SSNET Winner\)](#)

TEACHING & LEARNING (Coordinator with Complete Course Responsibility)

- **Stars, Galaxies & the Universe** (AST 192 University of Kentucky, Summer 2006). Course Evaluation: 3.4/4
- **In Quest of the Universe** (AST 130 Eastern Kentucky University, Spring 2007). No Evaluation
- **Classical Mechanics & Waves** (PHYS 231 University of Kentucky, Summer 2007). Course Evaluation: 3.1/4
- **Electricity, Magnetism & Light** (PHY 232 University of Kentucky, Summer 2008). Missing Evaluation
- Lecturing @ the University of the Western Cape:
- **Quantum & Nuclear Physics** (PHY312 2011-19/2021-22) [Lectures Online @ Nico Orce's YouTube Channel](#)
- **Energy** (PHY322 2013)
- **Nuclear Structure Physics** (PHY723 Honours, 2011-2021) Book & Videos in Preparation
- **Statistical Physics** (PHY722 Honours 2018)
- **Introductory Physics** (PHY111 2019-20) [Lectures Online @ Nico Orce's YouTube Channel](#)
- **Quantum Mechanics** (PHY722 Honours 2022)
- **Tastes of Nuclear Physics (2011-2020):** 9th edition hosted at the University of Zululand (200 attendees). [10th edition online with 615 participants + Videos of the Talks](#)
- [Physics World \(18 Dec 2020\)](#), [Physics in the Pandemic](#)
- [J. N. Orce, Nuclear Physics News Volume 31/No. 1 \(2021\)](#), [Humanity and Physics Meet @ 10th Tastes of Nuclear Physics](#)

OUTREACH & MEDIA (More @ <https://nuclear.uwc.ac.za> Outreach & Media)

- **CERN Beam Time for Schools** (Cedar House)
- Outreach Talks @ High Schools: THOPE Foundation, Belhar High, The [Ark City of Refuge & Zola High](#) in Khayelitsha
- **Chair of the Research Open Day @ UWC**. Plenary talks by Nobel Physics Laureate [Serge Haroche](#)
- [Africa's Universities can Shrug Off History and Stage Science Revolutions](#)
- [UWC Takes on Big Science](#)
- [UWC Students Make History @ CERN Lab in Switzerland](#)
- [This is Africa. Nuclear physicist Cebo Ngwetsheni Published in the Physics Letters Journal](#)
- [Nuclear Physicist, Kenzo Abrahams, Part of Breakthrough Scientific Discovery](#)
- [Fun with Physics: Isomeric & the Radioactive Ion Beam Facility \(with Preface by Phil Walker\)](#)
- [More Fun Nuclear Science](#)

REFERENCES

- [Prof Reginaldt Madjoe](#) rmadjoe@uwc.ac.za (Physics & Astronomy, UWC)
- [Prof Robert Lindsay](#) rlindsay@uwc.ac.za (Physics & Astronomy, UWC)
- [Prof Sifiso Ntshangase](#) (Co-PI for GAMKA & MANDELAb, University of Zululand) sifiso.mgazi@gmail.com
- [Prof Steven Yates](#) (Glenn T Seaborg Award for Nuclear Chemistry 2006, University of Kentucky, USA) yates@uky.edu
- [Prof David Jenkins](#) (Author of "Radiation Detection for Nuclear Physics", University of York, UK) david.jenkins@york.ac.uk
- [Prof John Wood](#) (3 Books in Quantum Mechanics/Nuclear Physics, GeorgiaTech, USA) john.wood@physics.gatech.edu